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**U.S. Department of the Interior
Fish and Wildlife Service
Draft Environmental Assessment
for the
Cypress Creek National Wildlife Refuge
2012 Hunt Plan**

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Abstract: The U.S. Fish and Wildlife Service (Service) proposes to continue compatible hunting on the Cypress Creek National Wildlife Refuge. This Environmental Assessment (EA) evaluates three alternatives for hunting resident game and migratory birds on Cypress Creek National Wildlife Refuge (Refuge). The Refuge recently revised the 1992 Hunt Plan and proposes revisions to hunting regulations and opening 540 acres of newly acquired lands. The Refuge is located in southern Illinois within Alexander, Johnson, and Pulaski and Union counties. Hunting is currently authorized and ongoing on approximately 16,000 acres of the Refuge. This activity has been permitted on Refuge land since 1992 via an approved hunt plan and is also outlined in the Refuge's Comprehensive Management Plan completed in 1996. This environmental assessment presents three possible alternatives: (A) No hunting; (B) Maintain the current hunting program (No Action) and (C) Maintain hunting program with revisions to the Code of Federal Regulations (CFR) and the addition of newly acquired lands (Preferred Alternative).

Alternative (C) is the preferred alternative based on the National Wildlife Refuge System Improvement Act of 1997 which recognizes hunting as an appropriate and compatible wildlife –dependent use of the Refuge System. It also states that hunting should receive priority consideration in planning and management. The general broad objectives of the hunting program are:

- Provide the public with safe and enjoyable hunts that are compatible with the Refuge purpose.
- Provide quality hunting opportunities that minimize conflict with other public use activities.
- Promote public understanding of and increase public appreciation for the Refuge's and surrounding area's natural resources;
- Control large build-up of wintering populations of snow geese (large build-ups would eventually disrupt distribution strategies that have been agreed upon by state and federal flyway groups).
- Manage white-tailed deer populations to reduce their impacts on habitat restoration and reforestation efforts.

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CHAPTER 1. PURPOSE AND NEED FOR ACTION

1.1 Purpose

This environmental assessment presents three possible alternatives for opening and administering a hunting program on Cypress Creek National Wildlife Refuge.

1.2 Need

Providing compatible wildlife-dependent recreation and education activities on units of the National Wildlife Refuge System is a Service priority. The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) provides authority for the Service to manage the Refuge and its wildlife populations. In addition it declares that compatible wildlife-dependent recreation is legitimate and appropriate uses of the Refuge System that are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation. The Improvement Act directs managers to increase recreational opportunities, including hunting on National Wildlife Refuges when compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

Hunting on the Refuge provides wildlife-dependent recreational opportunities that promote a better understanding and appreciation of wetlands habitats and associated fish and wildlife resources. Implementation of the proposed actions will be consistent with the Refuge Recreation Act, Refuge Administration Act, and the environmental assessment for the establishment of the Refuge.

1.3 Decisions That Need To Be Made

This Environmental Assessment is prepared to evaluate the environmental consequences of administering a hunting program on Cypress Creek National Wildlife Refuge. Three alternatives are presented in this document:

- (A). No hunting;
- (B). Maintain the current hunting program (No Action); and
- (C). Maintain hunting program with revisions to the Code of Federal Regulations (CFR) and the addition of newly acquired lands (Preferred Alternative).

The U.S. Fish and Wildlife Service's (Service) Regional Director, is the official responsible for determining the action to be taken in the proposal by choosing an alternative. The Regional Director will also determine whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact decision, or whether the preparation of an Environmental Impact Statement is needed.

1.4 Background

Cypress Creek National Wildlife Refuge (Refuge) was established on June 26, 1990 under the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901 b, 100Stat.3583, PL 99 645). The Refuge is located in southern Illinois approximately 7 miles north of the confluence of the Ohio and Mississippi Rivers. It is situated along forty miles of the Cache River and its tributaries in Alexander, Johnson, Pulaski and Union counties.

The Refuge is also part of a larger boundary delineated by the Cache River Wetlands Joint Venture Project; this includes 60,000 acres shared by the Refuge, Illinois Department of Natural Resources (at Cache River State Natural Area and Horseshoe Lake Fish & Wildlife Area), and The Nature Conservancy (Appendix A).

The Refuge was established as a component of the New Madrid Wetland project which is part of the North American Waterfowl Management Plan. The Refuge provides important habitat for not only waterfowl, but also for a variety of wetland dependent shorebirds, wading birds and other wildlife. The Cache River basin has traditionally been a waterfowl breeding, wintering and migration stop-over area in the Mississippi flyway. The Cache River – Cypress Creek Wetlands were designated as “wetlands of international importance – especially as waterfowl habitat” in 1996 under terms of the Ramsar Convention on wetlands, UNESCO (United Nations Educational, Scientific, and Cultural Organization).

The Refuge acquisition boundary encompasses 35,529 acres along the Cache River from Highway 37 then west and south to Mound City, IL. This area is primarily rural and most of the land that is not forested is used for agriculture. Land for inclusion in the Refuge is acquired from willing sellers on a continual basis. Approximately 16,000 acres within the Refuge acquisition boundary have been purchased.

Hunting migratory game birds, small game, furbearers, deer and turkey is currently permitted on the Refuge. This action was authorized in the 1992 Refuge Hunt Plan, the 1996 Refuge Comprehensive Management Plan and the Refuge Compatibility Determination completed for hunting. The area includes a diversity of habitats from floodplain and upland forests, to deep water swamps and shallow wetlands, to agricultural and early successional fields. These areas support waterfowl, deer, turkey, squirrels, rabbits, and other game species. All hunting activities are planned and operated with the Refuge’s primary goals and objectives as the guiding principles. The Refuge is proposing public hunting on newly acquired tracts and revising regulations to be consistent with Illinois state seasons and regulations.

CHAPTER 2: PROPOSED ACTION AND ALTERNATIVES

The Service evaluated possible hunting program changes through three alternatives: (A) No Hunting, (B) Maintain the current hunting program (No Action) and (C) Maintain hunting program with revisions to the Code of Federal Regulations (CFR) and the addition of newly acquired lands (Preferred Alternative).

2.1 Alternatives Considered But Not Developed

Alternative (A) which would have closed the Refuge to all hunting was considered but not carried forward for detailed analysis.

2.1.1 Alternative A (No Hunting)

This alternative would require existing hunting to cease on the Refuge. Most lands presently managed as part of the Refuge were hunted prior to acquisition and continue to be open to public hunting. The National Wildlife Refuge System Improvement Act (Improvement Act) of 1997 identifies hunting as one of six priority uses of lands within the Refuge System. To eliminate hunting on Refuge lands where it already has been determined to be compatible with Refuge purposes and the mission of the System would not meet the intent of the Improvement Act. This alternative was not carried forward for further analysis.

2.2 Alternatives Developed For Detailed Analysis

Two alternatives were carried forward for detailed analysis.

2.2.1 Alternative B (No Action) - Maintain Existing Hunt Program with No Hunting on Newly Acquired Lands

The current hunt program includes migratory game birds, small game, furbearers, deer and turkey on the Refuge. This alternative would maintain the hunting program but not allow hunting to occur on newly acquired lands. Under provisions of the National Wildlife Refuge Administration Act of 1966, refuges are “closed until open.” Thus, if the Service takes no action, 540 acres of refuge lands would remain closed to hunting which may result in depredation complaints from local landowners and farmers may increase due to a possible population growth of white-tailed deer and geese within closed areas. There would also be no change to current regulations or other current public use and management strategies employed on the Refuge. This includes the following regulations and management:

--provide dove hunting beginning on September 1 and continuing on the following Mondays, Wednesdays, and Saturdays throughout the State season (rather than following the state’s hunting hours of sunrise to sunset during the week);

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- require all hunters to carry in their possession the general hunt permit in addition to state permits and licenses;
- allow steel shot only (rather than non-toxic shot) and permit lead shot for hunting turkeys; and
- allow hunting of geese at the Bellrose Waterfowl Reserve after the duck season has closed.

2.2.2 Alternative C (Preferred Alternative) – (C). Maintain hunting program with revisions to the Code of Federal Regulations (CFR) and the addition of newly acquired lands (Preferred Alternative).

This alternative would allow participants to hunt migratory game birds, small game, furbearers, deer and turkey on the Refuge with the addition of 540 acres of newly acquired lands. Hunting opportunities will be coordinated with and within the framework of the Illinois Department of Natural Resources season dates and regulations. This will apply also to eight newly acquired tracts after the following determinations are made for each area:

- 1). Public access to a tract does not require travel across private property or closed government land;
- 2). Sites are available for hunters to park their vehicles legally and in a manner that will not adversely affect the habitat in the area or existing public travel routes;
- 3). Public hunting will not have adverse effects on any federally listed or proposed species of concern and
- 4). Hunting can be conducted without jeopardizing public safety.

Refuge management may establish specific regulations for an individual area to ensure these requirements are met. Certain areas may remain closed or be periodically closed to hunting if there are habitat, wildlife protection, or public safety concerns.

The alternative will also include implementing changes in Refuge specific regulations in order to simplify and provide consistency between state and federal agency requirements; and to change the management strategy at the Bellrose Waterfowl Reserve to provide a disturbance free sanctuary.

2.3 Alternatives Action Table

Table 1 summarizes the actions that are anticipated under each alternative. Detailed discussion of the environmental impacts of each alternative can be found in Section 4.

Table 1: Alternatives Action Table

Action	Alternative B (No Action) Maintain Existing Hunt Program with No Hunting on Newly Acquired	Alternative C (Preferred Alternative) Maintain the hunting program with revisions to the Code of Federal
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	Lands	Regulations (CFR) and the addition of newly acquired lands.
Species that will be hunted.	Ducks, geese, rails, snipe, woodcock, mourning dove, white-tailed deer, wild turkey, bobwhite quail, rabbit, squirrel, groundhog, raccoon, opossum, fox, coyote, skunk, crow as allowed by Illinois law.	Ducks, geese, rails, snipe, woodcock, mourning dove, white-tailed deer, wild turkey, bobwhite quail, rabbit, squirrel, groundhog, raccoon, opossum, fox, coyote, skunk, crow as allowed by Illinois law.
Compatible with Refuge Goals and Purpose	Yes. Provides for priority public uses and maintains healthy wildlife populations with the exception of 540 acres of newly acquire land.	Yes. Provides for priority public uses and maintains healthy wildlife populations.
Provides for Hunting	Yes. But does not maximize hunting opportunities on newly acquired lands (540 acres) and includes inconsistencies with IDNR regulations.	Yes. Provides hunting consistent with Illinois DNR seasons and regulations; adds 540 acres to the hunting program and provides a disturbance free sanctuary at the Bellrose Waterfowl Reserve.
Hunting and non-hunting activities segregated	Yes. Separates users on 540 acres of newly acquired lands that is closed to hunting however conflicts are possible, since hunting is permitted on surrounding Refuge property. If conflicts exist, Refuge manager would be able to close an area or unit to alleviate public safety concerns.	No. Doesn't separate uses, conflicts possible, but deemed minimal. If conflicts exist, Refuge manager would be able to close an area or unit to alleviate conflicts.
Meets needs identified by public	No. Does not maximize hunting opportunities as identified by most public and partners resource agencies.	Yes. Maximizes hunting opportunities as identified by most public and partner resource agencies.

CHAPTER 3. AFFECTED ENVIRONMENT

This section describes the area's natural environment including vegetation, fish, and wildlife resources, and cultural resources.

3.1 Physical Characteristics

Cypress Creek National Wildlife Refuge was established on June 26, 1990 under the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901 b, 100Stat.3583, PL 99-645). The Refuge is located in southern Illinois approximately 7 miles north of the confluence of the Ohio and Mississippi Rivers. It is situated along forty miles of the Cache River and its tributaries in Alexander, Johnson, Pulaski and Union counties. The

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Refuge is also part of a larger boundary delineated by the Cache River Wetlands Joint Venture Project; this includes 60,000 acres shared by the Refuge, Illinois Department of Natural Resources (at Cache River State Natural Area and Horseshoe Lake Fish & Wildlife Area), and The Nature Conservancy.

The Refuge acquisition boundary encompasses 35,529 acres along the Cache River from Highway 37 then west and south to Mound City, IL. Approximately 16,648 acres within the Refuge boundary have been purchased. Newly acquired tracts include 540 acres divided among eight parcels and referred to as the Tract 1 - Tract 5 (see map Appendix B). These properties are described below in Section 3.2

3.2 Biological Environment & Habitat/Vegetation

The Refuge is located in southern Illinois approximately 7 miles north of the confluence of the Ohio and Mississippi Rivers. It is situated along forty miles of the Cache River and its tributaries in Alexander, Johnson, Pulaski and Union counties. This area is primarily rural and most of the land that is not forested is used for agriculture. Approximately 16,000 acres within the Refuge acquisition boundary have been purchased. The Refuge is divided into eight management units that differ in soils, hydrology, topography, land use and vegetative cover. The following tables summarize total acreage and land cover within each management unit in the purchase boundary (Table 2) and the acreage in Refuge ownership (Table 3).

Table 2. Land Cover Acres within Cypress Creek National Wildlife Refuge Management Units (Acquisition Boundary)

Management Unit	Urban	Forested	Wetlands	Water	Grass	Ag	Restored	TOTAL
Cypress Creek	7	1092	314	32	793	2246	1791	6280
Limekiln	10	385	79	15	798	4505	902	6694
Cache River	15	339	828	188	170	2409	1327	5276
Butter Ridge	44	734	230	101	941	3410	474	5936
Indian Camp Creek	7	904	398	101	339	1208	35	2992
Sandy Creek	5	1250	339	32	343	1045	1151	4180
Lake Creek	2	1619	203	89	457	618	264	3252
Old Channel	49	272	84	133	106	1868	25	2537
TOTAL	124	6595	2475	691	3947	17309	5869	35,320

Table 3. Land Cover Acres within Cypress Creek National Wildlife Refuge Management Units (Refuge Ownership)

Management Unit	Urban	Forested	Wetlands	Water	Grass	Ag	Restored	TOTAL
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Cypress Creek	2	863	208	12	353	450	1611	3499
Limekiln	0	142	42	10	163	351	992	1700
Cache River	2	148	168	72	37	27	751	1205
Butter Ridge	17	484	192	54	314	751	469	2281
Indian Creek	2	393	210	42	151	126	35	959
Sandy Creek	2	983	289	32	222	277	0	1805
Lake Creek	0	1650	185	72	378	531	264	3080
Old Channel	2	203	74	101	37	596	25	1038
TOTAL	27	4866	1368	395	1655	3109	4147	15,567

Newly acquired tracts include 540 acres and are described below (see also Appendix B):

Tract 1: This 251-acre tract is located east of Highway 3 in Alexander County, IL. It connects Refuge property to the Mississippi River; the Cache River Diversion canal bisects the middle of the tract. This property was secured through the American Land Conservancy in 2007. The tract was previously managed by a private lumber company (Westvaco Corporation) as a pulp wood plantation. The property was acquired by a private lumber company in 1975 for pulp wood timber production and had been leased for hunting until Refuge acquisition. Currently the site contains approximately 220 acres of pulp wood plantations (sycamore, ash, sweetgum, sycamore, cottonwood) ranging in age from 10 to 30. The remaining 31 acres are remnant bottomland hardwood stands.

Tract 2: This 140-acre tract is located south of Shawnee College Road in Pulaski County. It adjoins the Brushy tract to the east and is primarily upland with a downward slope to the east. When acquired in 2008, the property was in agriculture; it was planted with native seedlings in 2010. It currently includes early successional vegetation in addition to a variety of seedlings.

Tract 3: This 2-acre tract abuts refuge land on its east boundary and the village of Ullin on its west boundary. This property is low, flat floodplain forest that is regularly flooded by the Cache River.

Tract 4: This 80-acre tract abuts refuge land along its south and east boundary. This property has 30 acres of National Wetland Inventory wetlands and is bisected by Cypress Creek. It includes about 55 acres of forest and a 10-acre tilled agricultural field. This property is about 2.5 miles west of Cypress, IL and has frontage on Cypress Road.

Tract 5: The 69-acre Eagle Pond tract abuts refuge land along its north boundary and IDNR land along its east and west boundary. This property is characterized by cypress-tupelo swamp. The Cache River passes along the south boundary in through the

southwest corner of this property. This property is about 1 mile south of Perks, Illinois along the Cache River.

3.2.2 Listed, Proposed, and Candidate Species

The Refuge follows recovery plan guidelines for the management of the following federally threatened and endangered species. These species may be present in the vicinity of the Refuge proposed for hunting and are listed below:

Indiana Bat- The range of the endangered Indiana bat includes most of the upper Midwestern United States from Oklahoma, Iowa, and Wisconsin east to Vermont and south to northwestern Florida. The distribution of this species is greatest in cave-rich areas where there is suitable forested habitat. During the summer, the Indiana bat disperses over their entire range selecting old growth bottomland hardwood forests and riparian areas for feeding and reproduction (Illinois Natural History Survey, 2004). Roosting bats and maternity colonies occur under loose bark of dead standing trees and also under large bark scales on live shagbark hickory, kingnut hickory and water hickory trees, or other trees with loose, shaggy bark.

Gray Bat -The gray bat is listed as endangered and occurs in Alexander, Johnson, Pope, and Pulaski counties where it inhabits caves both during summer and winter. This species forages over rivers and reservoirs adjacent to bottomland forested tracts (Illinois Natural History Survey, 2004),

Not all of the causes of Gray and Indiana bat population declines have been determined. Although several known factors have caused declines in the past (vandalism, gates on cave entrances, natural hazards such as flooding and freezing), they do not appear to account for the current decline. Potential, but unproven, causes include changes in the microclimate of specific caves, chemical contamination, and land use practices (such as forest fragmentation, fire suppression, loss of plant community diversity). White-nose syndrome (WNS) has also recently been linked to the decline in many cave-dwelling bat species. Until we better understand the factors that are contributing to the decline of the Indiana bat, we cannot accurately assess whether the loss of summer habitat is limiting to the species. Increased knowledge of the species' ecology during the summer and migration seasons is needed in order to effectively conserve and restore bat populations (USFWS 2004).

Bald Eagle - Historically, there may have been as many as 100,000 nesting Bald Eagles (*Haliaeetus leucocephalus*) in the conterminous United States when the bird was adopted as our national symbol in 1782. But, by the early 1900s, Bald Eagle numbers were declining nationwide because of habitat loss and illegal shooting. The Bald and Golden

Eagle Protection Act passed in 1940 prohibited killing or selling Bald Eagles and their parts. However, the populations continued to decline due to the pesticide DDT. By 1963, only 417 nesting pairs were found in the lower 48 states. In 1967, the Bald Eagle was listed as endangered under the Endangered Species Preservation Act. Following the passage of the Endangered Species Act in 1973, the bird was listed as endangered or threatened throughout the lower 48 states. Numbers have steadily increased since DDT was banned in the U.S. in 1972. July 12, 1995, the FWS announced that Bald Eagles in the lower 48 states had recovered to the point that those populations previously considered endangered had been down-listed to threatened status. Populations continued to increase. Today, there are more than 5,700 nesting Bald Eagle pairs. On June 28, 2007 the Bald Eagle was removed from both the federally threatened and endangered species lists. Even though it is de-listed, the species is still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (USFWS 2004).

3.2.3 Other Wildlife Species

The Refuge and associated Cache River wetlands are known for diversity and outstanding wildlife values. Waterfowl, shorebirds, wading birds, raptors, songbirds, reptiles, amphibians, furbearers and other mammals use the area (Illinois Department of Natural Resources, 1997).

Birds - The Cypress Creek/Cache River basin which is cradled between the Ohio and Mississippi Rivers provides an important bird migration corridor within North America. In 1994 the area was designated a "Wetland of International Importance" by the Ramsar Convention and an "Important Bird Area" by Audubon. Nearly 250 species of resident and migratory bird species use the Refuge throughout the year. Migration counts number in the thousands and include ducks, geese, shorebirds, wading birds, and countless other avian species. Wide arrays of other avian species use the Refuge due to the diversity of habitats. The Bald Eagle is a fairly common migrant and winter resident along the Ohio, Mississippi and Cache Rivers, and 3 pairs of birds are currently nesting on the Refuge. State listed endangered species which often use the Refuge include Northern Harrier, Little Blue Heron, and Barn Owl.

The number of waterfowl that use Refuge habitats varies from year to year depending on the time of year and water availability. In recent surveys conducted on the Refuge, mallards, wood ducks, gadwalls, American widgeons, northern shovelers, ring-necked ducks, green-winged teal, blue-winged teal, and canvasbacks have all been identified using Refuge habitats. There is a substantial population of resident wood ducks that use the Refuge year round for breeding, nesting, and raising their young. Hooded mergansers, another cavity nester, have also been identified on the Refuge.

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The American woodcock (*Scolopax minor*) is a popular game bird throughout eastern North America. The management objective of the Service is to increase populations of woodcock to levels consistent with the demands of consumptive and nonconsumptive users (USFWS 1990).

The mourning dove (*Zenaida macroura*) is one of the most widely distributed and abundant species in urban and rural areas of North America. At this time the responsibility to manage this species has been delegated to the Department of Interior. The primary management goal of the Service is to maintain dove populations at a healthy and productive state. To date, every bird count or survey conducted on the Refuge has included mourning doves. This includes counts that have been done in spring, summer, and winter.

Wild turkey populations are very dynamic and weather dependent. In Illinois the number of hens reported in 2011 was 395 individuals above the ten year average and the number of poults reported was 383 individuals above the ten year average (Illinois Department of Natural Resources, 1997). Hunting dates are set to accommodate the population with most females mating before the season starts. During the spring seasons in Illinois only birds with beards can be harvested ensuring female survival and a chance to successfully breed.

Mammals – The Refuge includes 47 species of mammals. A few of the resident species attracted to river habitats include mink, muskrat, raccoon, river otter, opossums, coyotes, bobcats, bats, and beaver. At most refuges, relatively high populations of beaver tend to complicate water management activities. River otter, once nearly eliminated in this area, are now seen utilizing Refuge wetlands and river banks more frequently. White-tailed deer are the only big game species in the vicinity of the Refuge.

White-tailed deer (*Odocoileus virginianus*) represent one of the most important and popular big game mammals in Illinois. According to Illinois DNR, deer population model estimates that there are currently between 750,000 and 800,000 deer in the state. Since mature deer have few, if any, natural predators in our region, population control is maintained by hunting pressure, disease, management, and deer/vehicle collisions. Deer are frequently observed throughout the winter and summer months throughout the Refuge.

Reptiles and amphibians – The Refuge and the surrounding wetlands include 54 species of reptiles and amphibians. Of the 20 species of frogs and toads in the state, 18 have been recorded in the watershed. The Refuge also provides habitat for 20 species of snakes, three of which are venomous (copperhead (*Agkistrodon contortrix*), cotton mouth (*Agkistrodon piscivorus*), and timber rattlesnake (*Crotalus horridus*).

3.3 Land Use

Despite changes that have occurred over the years, the Refuge provides valuable habitat for migratory birds as well as numerous species of resident mammals, birds, reptiles, amphibians, and fish. The Cypress Creek/Cache River watershed is comprised of four overlapping physiographic regions; the Upper East Gulf Coastal Plains, Ozarks, Mississippi River Alluvial Plain, and the Interior Low Plateau. These areas contain unique plant and animal species influenced and molded by the habitat and environmental conditions within the specific region. When these regions overlap, species from each region can be found together. These conditions create a habitat area of unusual species abundance and diversity.

The Refuge is composed primarily of wetlands, bottomland forest, upland forest, and agricultural lands. There are five general categories of wetlands: 1) swamp; 2) shrub swamp; 3) open water; 4) wet floodplain forest; and 5) successional fields (wet farmland). Several species found in the Refuge are at the northern extent of their range and usually are characteristic of species found at more southern latitudes, notably bald cypress and water tupelo. The swamp and shrub swamp areas are dominated by these trees with varying amounts of buttonbush scrub thicket. Water in these areas stands at a depth of approximately two feet when full. The bottomland hardwood forest (wet floodplain forest) represents the transition zone between permanent water areas and uplands. Soils range from areas that are saturated throughout most of the growing season to sites where soil saturation may last a week or month out of the growing season. In this area, the cypress and tupelo become increasingly less frequent while sweet gum, swamp cottonwood, oak, elm, ash, sugarberry, hickory, and maple become more common.

Agriculture has played a significant role in the Cache River watershed. The predominant land use in the basin is agriculture with more than 70% of the watershed (345,000 acres) in production. The small remnants of historical wetlands in the basin only make up about 4% of the watershed (20,000 acres). The Cache basin lies farther south than other “southern” cities as Louisville, Lexington, and Richmond resulting in a relatively long average frost-free growing season of 230 days. Corn and soybeans are the principle crops of the Cache River basin farms along with sorghum, wheat, and hay, and some livestock. Because the dominant soils in the basin are not very fertile and in some years considerably wet compared to the prairie soils of central Illinois, overall yields of staple row crops are typically below the state average.

3.4 Cultural Resources

A comprehensive cultural resource overview for the Refuge was completed in 1996 (Kullen, 1996). The survey entails a summary of known cultural resources found within

the Refuge acquisition boundary including an additional five mile radius around it. Documented archeological sites on the Refuge represent all the Midwest United States cultural periods from the earliest Paleo-Indian through the 19th century. The last native tribal people in the Cache River Valley included the Trail of Tears movement of people from southern Appalachia to reservations in Oklahoma in 1838 (Heitmeyer, 2012). The most common archeological finds are isolated projectile points and small upland camp sites. Based on this report there are no significant historic sites, structures, or landmarks documented on the Refuge.

3.5 Local Socio-economic Conditions

The Refuge and associated Cache River Watershed in southern Illinois is an attraction for hunters and outdoor enthusiasts. Refuge hunting opportunities provide benefits to the local economy through the sales of food, gas, supplies or lodging. According to research on economic effects, hunting on the Refuge resulted in significant expenditures (1.1million) for both travel-related goods and services and activity related equipment purchases (Caudill, 2003).

Chapter 4: ENVIRONMENTAL CONSEQUENCES

This chapter describes the foreseeable environmental consequences of implementing alternatives in Chapter 2. A detailed comparison between alternatives and their anticipated consequences is presented, describing “impacts” or “effects.” When detailed information is not available , those comparisons are based on the professional judgment and experience of Refuge staff.

4.1 Alternative B. Maintain Existing Hunt Program with No Hunting on Newly Acquired Lands (No Action)

Under this alternative hunting is permitted on approximately 15,000 acres with exception to 540 acres of newly acquired land. Hunting is conducted in accordance with the State guidelines and seasons subject to Refuge specific regulations listed in the 50CFR32.32. This include the following Refuge specific regulations:

- provide dove hunting beginning on September 1 and continuing on the following Mondays, Wednesdays, and Saturdays throughout the State season.
- require all hunters to carry in their possession the general hunt permit in addition to state permits and licenses;
- allow steel shot only (rather than non-toxic shot) and permit lead shot for hunting turkeys; and
- allow hunting of geese at the Bellrose Waterfowl Reserve after the duck season has closed.

4.1.1 Habitat Impacts

No additional public use impacts on vegetation are expected with this alternative. Non-consumptive users would still be accessing the areas for other wildlife dependent activities. Impacts to Refuge soil and vegetation by hunters are minimal. Hunting is conducted on foot by individual and current regulations prevent the cutting or removal of vegetation and the use of screw-in steps. Hunters with disabilities may use all-terrain vehicles (ATV) or utility-terrain vehicles (UTV) on existing roads and trails and be accommodated on a case by case basis.

On newly acquired tracts where hunting is not permitted, white-tailed deer populations may increase to cause damage to vegetation on the Refuge or adjacent private lands. The Refuge receives complaints of deer depredation from private landowners adjoining the Bellrose Waterfowl Reserve which is closed to deer hunting.

4.1.2 Biological Impacts

This alternative will have few biological impacts given that the majority of the Refuge is open to hunting. As additional lands are purchased and not hunted, potential damage to agricultural croplands, as well as native vegetation may occur without the population control provided by hunting. However, maintaining the current hunting program at the Bellrose Waterfowl Reserve will have biological impacts on waterfowl, in particular, ducks. The management strategy of using hunting to prevent large buildups of wintering populations of Canada geese is no longer a viable concern since geese rarely move farther south than central Illinois. Disturbance caused by hunting geese at Bellrose can affect duck populations by decreasing foraging time and their period of rest as well as pair and family bonding. Continual disturbance can be detrimental by causing birds to completely abandon a site or disperse to poorer quality habitat.

4.1.3 Listed Species

No effect is expected for any of the threatened and endangered species found within the Refuge boundaries under this alternative

4.1.4 Historic Properties and Cultural Resources

This alternative will result in no additional ground disturbance or negative effect to historic properties or cultural resources.

4.1.5 Cumulative Impact Analysis of Alternative B (No Action)

4.1.5.A Anticipated Direct and Indirect Impact of No Action on Wildlife Species

Under this alternative, hunting will continue on approximately 15,000 acres with the exception of 540 acres of newly acquired land (Tracts 1-5) not open to hunting; this property makes up approximately 4% of the Refuge. This alternative of no hunting would

have little to no effect on most wildlife populations. The possible exception would be localized impacts of white-tailed deer on neighboring private land. Deer populations could become too large for an individual unit which in turn would create a situation of over browsing of native vegetation and depredation to private agricultural property.

Alternative B would also allow the goose hunt at the Bellrose Waterfowl Reserve to continue. This hunt was established in 1993 with the intent to discourage large build-ups of Canada geese in the moist-soil units. This management objective is no longer a viable concern since geese rarely move farther south than central Illinois. Disturbance caused by hunting geese at Bellrose can affect duck populations by decreasing foraging time and their period of rest as well as pair and family bonding. Continual disturbance can be detrimental by causing birds to completely abandon a site or disperse to poorer quality habitat.

4.1.5.B Anticipated Direct and Indirect Impact of No Action on Refuge Programs, Facilities, and Cultural Resources

Other Refuge Wildlife-Dependent Recreation: The majority of visitor use on the Refuge includes bird watching and wildlife observation, hunting, and fishing, and environmental education. The majority of these visits take place from November through April. Hunting, fishing and wildlife observation visits, particularly bird watching, account for the highest wildlife-dependent recreational use suitable for the newly acquired tracts.

Under this alternative, the public would not have the opportunity to participate in hunting on 540 acres of the Refuge. Hunting which is one of the priority public uses, and compatible with the purposes for which the Refuge would be permitted on approximately 15,000 acres. Hunting is also a way for the public to gain an increased awareness of the National Wildlife Refuge System.

Refuge Facilities: Under this alternative, the current hunting program will be maintained; hunting and non-hunting users will continue to utilize the existing roads, parking areas, and trails. There would be no additional impacts to Refuge facilities (roads, parking areas, trails).

Cultural Resources: This alternative will not have any additional impacts to cultural resources.

4.1.5.C Anticipated Direct and Indirect Impact of No Action on Refuge Environment and Community

The No Action alternative will have little if any impact on soils, air quality, water quality or solitude. Vegetation, as stated above, could be affected on acreage that is not hunted if the deer population increases to a level to cause degradation of newly planted seedlings and native vegetation.

This alternative may have impacts on hunting opportunities in the local area. Over the last 15 years it has become increasingly difficult for hunters to acquire access to hunt on private land. More and more landowners are leasing their land for an entire season. This change in land use has increased the importance of public land to hunters. Not opening these units to hunting will result in the continued decrease of lands open to hunting for many hunters.

4.1.5.D Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Hunting was allowed on most of these lands prior to Refuge acquisition. These hunts were done within state regulations and seasons. This alternative would not allow hunting on newly acquired lands and therefore there would be no anticipated impacts on this property.

4.1.5.E Anticipated Impacts If Individual Hunts are Allowed to Accumulate

This alternative would not allow hunting on newly acquired land within the Refuge and therefore there would be no anticipated impacts.

4.1.6 Environmental Justice

Under this alternative the public would be denied an opportunity to hunt on 608 acres of Refuge property. Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities’ access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

4.2 Alternative C. Maintain hunting program with revisions to the Code of Federal Regulations (CFR) and the opening of newly acquired lands. (Preferred Alternative)

The Refuge has permitted hunting and administered a hunt program since 1992 and the Service has determined that this use is compatible with the purposes of the Refuge. The hunting program is currently conducted in accordance with the State guidelines and

seasons subject to Refuge specific regulations listed in the 50CFR32.32. Under this alternative, the Refuge will maintain a hunting program that includes revisions to regulations and the opening of an additional 540 acres of newly acquired land. This action will include implementing changes in Refuge specific regulations in order to simplify and provide consistency between state and federal agency requirements; and to change the management strategy at the Bellrose Waterfowl Reserve to provide a disturbance free sanctuary. Actions under this alternative will not adversely affect, temporarily or permanently, the Service's ability to meet land use goals on Refuge units open to hunting.

4.2.1 Habitat Impacts

Hunting would not have significant adverse effect on the quality of wildlife habitat or the natural environment. Hunter access will be allowed by foot access only. Parking will be restricted to designated parking areas. Impacts on vegetation should be temporary and similar to that occurring from other visitors that are participating in wildlife observation, hiking, or other wildlife dependent recreational use. Hunters with disabilities may use all-terrain vehicles (ATV, UTV) on existing roads and trails and be accommodated on a case by case basis.

4.2.2 Biological Impacts

With the addition of 540 acres to hunting, disturbance to migratory birds, game birds, upland game, deer and resident wildlife will be the same as occurs on the surrounding Refuge property that is currently open to hunting. The harvest of refuge wildlife species will be in accordance with Federal and state regulations. This alternative will close the Bellrose Waterfowl Reserve to hunting thus providing a disturbance free sanctuary specifically for ducks; impacts may occur if Canada geese and snow geese distributions change and establish large wintering populations within the Reserve which could result in a depletion of food supplies. At this time, the Project Leader will determine if hunting or another strategy is necessary to limit or decrease goose populations on-site.

4.2.3 Listed Species

No effect is expected for any federally listed threatened or endangered species or their critical habitat. A consultation pursuant to Section 7 of the Endangered Species Act has been completed as part of this EA and this revised Hunt Plan. No impacts are anticipated for state listed species.

4.2.4 Historic Properties and Cultural Resources

There are no historical structures/properties on newly acquired tracts. Hunting is not expected to cause ground disturbance and will have no effect on any historic properties located on lands acquired in the future.

4.2.5 Cumulative Impact Analysis of Alternative C (Preferred Alternative)

4.2.5. A Anticipated Direct and Indirect Impact of Proposed Hunt on Wildlife

Resident wildlife populations in Illinois are actively managed by the Illinois Department of Natural Resources. Through surveys and monitoring, Illinois DNR carefully develops density figures when determining annual harvest needs to keep populations healthy (Illinois DNR Harvest Report, March 2011). There are no anticipated impacts; the number of hunters per square mile and wildlife populations should continue to stay the same on refuge property and the surrounding area. Also the allowance of public hunting will nurture a cooperative relationship with adjacent landowners by minimizing crop depredation from deer.

White-tailed Deer

According to Illinois DNR deer population remains high with estimates for 2011-12 at 800,000 and a deer density of 20-40 deer per square mile in the southern Illinois zone (Alexander, Pulaski, and Union Counties). From 2005 to 2011 deer harvest trends have ranged from 200,000 animals to 181,000 animals (IDNR, 2011).

The total combined harvest for Alexander, Pulaski, and Union counties in 2011-12 season was 7,476 deer. Below the percent of deer harvest based on an estimate of deer density per square mile and the annual harvest per county.

Table 4: Illinois DNR Deer Harvest Data for Alexander, Pulaski, Union, and Johnson Counties from 2009-2011

County	2008	2009	2010	2011
Alexander	828	896	780	791
Pulaski	1123	1049	1113	1093
Union	2963	2985	2777	2826
Johnson	2762	2706	2745	2766
Total Harvest	7676	7636	7415	7476

(Illinois DNR Harvest Report, 2011)

Table 5: Illinois Deer Density per Square Mile and Annual Harvest per County

County	Area per County	Average Deer Density per sq. mile	Deer Population Estimate	2011-12 Deer Harvest	Percent of Deer Pop. Harvested
Alexander	235 sq. miles	22	5,170	791	15%
Pulaski	200 sq. miles	37	7,400	1093	15%
Union	413 sq. miles	37	15,281	2826	18%
Johnson	349 sq. miles	37	12,913	2766	20%

(Illinois DNR Harvest Report, 2011)

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This alternative would provide hunting opportunities on an additional 540 acres (approximately 3%) of the Refuge within Alexander, Pulaski, Johnson and Union counties. Based on harvest data, an overall average of 6 deer per square mile were harvested in each county during the 2011-12 season. With the opening of additional Refuge land the average harvest is expected to increase by 25-45 deer. These numbers have negligible effects on the state populations and regional populations.

Wild Turkey:

The 2011 statewide poult to hen index of 2.19 was slightly below the recent 5 year average of 2.31. The percentage of deer hunters reporting turkeys in 2011 was 27.44 and is similar to the previous five year average of 27.69. In 2010, 50,011 of 182,270 successful hunters in Illinois reportedly saw 1,000,302 turkeys meaning that each successful hunter saw approximately 5.49 turkeys. Of these observations there were 366,869 turkeys sighted in Region 5, which include the Refuge counties of Union, Johnson, Alexander, and Pulaski (Illinois DNR Harvest Report, 2011).

Hunters during the 2012 spring took a preliminary total of 6,916 wild turkeys during all seasons in the South Zone, an increase from the harvest of 6,353 last year in the south. The North Zone total of 9,649 wild turkeys compares with last year's total of 9,137 in the north. Harvest data for Refuge counties of Alexander, Pulaski, Johnson and Union counties are included below.

Table 6: Illinois DNR Turkey Harvest Data 2009-2011

County	2009	2010	2011	2012	Refuge Only 2011	Refuge Only 2011
Alexander	136	142	125	119	4	4
Pulaski	106	144	140	140	12	6
Union	296	356	324	290	7	8
Johnson	237	298	261	269	2	2
Total Harvest	775	940	850	818	25	20

During the 2011 season, hunters reported taking 25 turkeys off the Refuge and 20 turkeys in 2012. Hunting turkeys under statewide regulations on an additional 608 acres of the Refuge will have minimal effect on the current population or harvest totals. With the opening of an additional acres of Refuge land, the average harvest is expected to increase to 25 – 50 birds. These numbers have negligible effects on the state populations and a minimal effect of regional populations.

Coyote and Raccoon Populations:

Raccoon, coyote, and fox are legally hunted legally in Illinois. Illinois DNR shows stable, populations of these species and have hunting and trapping programs. Hunting of these species is also dependent on the price of pelts in any given year. Over the last five

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years an average of 70,000 coyotes are harvested each year in Illinois. About 75 percent of these are taken by hunters; 25 percent by trappers. Raccoons are abundant and found throughout Illinois. Their numbers have increased dramatically since the early 1900s, and population densities are estimated at 9 to 45 raccoons per square mile. Raccoon harvest over the last five years averaged 111,000 animals. With additional Refuge acres open to hunting, the average harvest is expected to have a negligible effect on state and regional populations of coyotes and raccoons

Rabbit and Squirrel Population

A conservative estimate for squirrel population density in Illinois is 1.5 squirrels per acre. The most reliable trend data for rabbits in Illinois is the road-killed rabbits counted in June and July per thousand miles traveled. For 2011 the southern Illinois index increased (up 48.5%) and the statewide index was up 32%. Harvest data over the last 10 years from 2001 to 2011 documented that hunting pressure has decreased by 50% or more for both of these species resulting in a decline in total harvest (IDNR, 2011). Illinois DNR has data showing hunting effort and wildlife harvest on IDNR public lands in Region 5 (which in the southern counties found on the Refuge); during the 2010-11 seasons 2,268 squirrels and 1137 rabbits were harvested from 135,816 acres. With additional Refuge acres open for squirrel and rabbit hunting, the average harvest is expected to have a negligible effect on the state and regional populations.

Mourning Dove

The mourning dove is one of the most widely distributed and most harvested game bird in North America with estimated U.S. harvests of over 19 million annually on average from 2005-2009. In Illinois, hunters harvested an estimated 873,182 doves in 2009. Approximately 350 million birds were estimated in the 2011 fall dove population estimate (Otis et al. 2008b). During the 2011 season, statewide data included 29,742 hunters with a harvest of 492,765 doves resulting in an average season bag of 16 birds. Currently the Refuge provides minimal habitat for doves and in the future these areas (cropland and open grasslands) will be reforested created an unsuitable environment for doves and dove hunting. As additional land is open hunting, the average harvest is expected to have a negligible effect on the state and regional populations.

Waterfowl

Under this alternative, the waterfowl season on Cypress Creek Refuge will follow the frameworks set in place for Illinois. The Refuge is located in the southern zone and seasons typically run from mid-November to mid-January. Additional revisions to the hunt plan include the closure of the Bellrose Waterfowl Reserve (Reserve) to a special goose hunt in order to provide a disturbance free sanctuary throughout the migration.

This change in management is a result of changes in the distribution of geese during the migration. In 1993, an annual public goose hunt was established within the Reserve; the hunt took place after the duck season closed to the end of the regular goose season. The

objective in establishing this hunt was to prevent a large buildup of wintering populations of Canada Geese while at the same time provide a public recreational opportunity. Traditionally, the Mississippi Valley Population of Canada Geese primarily migrated through and wintered in southern Illinois, Indiana, western Kentucky, and Tennessee; however, in recent years, they rarely move farther south than central Illinois. In these areas, migration patterns have changed due to changes in habitat and food sources.

The prevention of large buildups of wintering populations of Canada Geese can no longer be considered a viable concern that warrants the disturbance caused by a public goose hunt within an area that is designated a waterfowl sanctuary. While hunting is a priority public use, it has direct effects on the waterfowl using the Reserve. Disturbance caused by hunting to waterfowl resources can: 1) modify the distribution and use of habitats by waterfowl; 2) affect their activity budget and decrease their foraging time; and 3) disrupt pair and family bonds .

Waterfowl, in particular ducks, undergo two important life cycle events during the fall and spring migration/wintering period: fall-winter and winter-spring molt and pairing. As an example, most mallards complete fall-winter molt after arrival in the Cache. Following completion of fall-winter molt, most mallards begin courtship, and 90% of females are paired by early January. Table 7 shows the pairing chronology of some of the more commonly observed species that migrate through and winter in the Cache.

Table 7. Pairing chronology of some of the more common Anatinae that winter in the Cache River Watershed

Species	Pair Formation Period
Green-winged Teal	Late February-March
Blue-winged Teal	March-May
American Widgeon	Dec-February
Gadwall	October-November
Northern Pintail	Late October-December
Mallard	October-December
Black Duck	October-December
Canvasback	April-May
Redhead	March-April
Lesser Scaup	March-April
Ring-necked Duck	April-May
Bufflehead	April

Wintering waterfowl need access to areas that are free from human disturbance to complete seasonal and annual life cycle events. A disturbance can be characterized as an activity that causes an animal to deviate from behavior patterns that normally occur without human influence. A disturbance is produced when a human-related presence or object (e.g. motorized vehicle) or sound (e.g. gunshot) occurs that causes changes to the natural behavioral patterns of animals (Frid and Dill 2002). Activities such as hiking, photography, jogging, hunting, fishing, boating, research and management activities,

bicycling, and driving are among many types of disturbance that can and do occur on any National Wildlife Refuge. When birds leave the refuge because of human disturbance, high quality habitat is left unutilized for the duration of time that the birds are displaced. The length of time that a bird is displaced from a feeding site determines how much additional foraging effort will be required to replace lost food resources, which in turn impacts other maintenance activities such as molting, and courtship (Table 7). There are a number of research studies that examined how long it took waterfowl to return to habitats after being disturbed. For example, the return rate of mallards and Canada geese at Mingo NWR following vehicular disturbance indicated that two thirds of the birds were still displaced after 25 minutes. At the Russell Lakes State Wildlife Area in Colorado, mallards flew from a pond during disturbances and did not return within 1 hour (George et al. 1991). In Wisconsin, only 15-56 percent of canvasbacks returned to foraging sites following disturbances (Kahl 199). Thus, repeated disturbances (> 2 per hour), which occur when hunting access is permitted, can have serious detrimental impacts on the utilization of seasonal wetlands, which may ultimately cause birds to completely abandon a site, disperse to poorer quality habitat, and/or change feeding strategies. Public use and access is important, but uses must be managed so that disturbance to wildlife is minimized and habitat utilization is not compromised. With these objectives in mind, it becomes necessary to recognize that disturbance to waterfowl early in the day can negatively impact biological processes such as feeding, flight, metabolic processes, molting, preening, and resting. For example, birds are feeding early in the morning to obtain food resources, but are beginning to come to roost at sunset to begin a period of rest after returning from evening feeding. This period of rest is just as important as feeding because it permits the digestion of food prior to roosting and allows the repair of muscle fibers damaged during flight. Therefore, if measures to minimize or eliminate the cause of disturbance are not considered, the impacts from these activities can negatively affect the potential for wildlife to acquire the necessary resources needed to meet nutritional life history requirements throughout their annual life cycle (Raasch 1996, Fredrickson and Reid, 1988). Providing a waterfowl sanctuaries throughout the entire migration and wintering period, rather than only during the hunting season will minimize some of these impacts. Sanctuaries afford undisturbed access to waterfowl during biologically critical periods of the day.

Table 8. Estimated energetic costs of some common waterfowl activities in relation to basal metabolic rate (BMR). Values represent averages from the literature

Activity	Estimated cost x BMR
Resting	1.3
Alert	1.5
Comfort Movements	1.5
Oiling/preening	2.0
Courtship	2.0
Social Interactions	3.2
Swimming	3.2
Diving	5.0
Flying	12.0-15.0
Egg laying	
Early Follicular Growth	16.7
Maximum During Egg Laying	20+
Last Egg	10.2

With the exception of the Reserve, approximately 15,000 Refuge acres are open to hunting for the entire waterfowl season; in addition there are numerous opportunities for goose hunters elsewhere on several wetlands owned by the Illinois Department of Natural Resources and The Nature Conservancy. In contrast, Bellrose Reserve will provide the only public area within the watershed that is intensively managed for waterfowl and completely closed to public access throughout the entirety of the migration period.

The annual USFWS Waterfowl Population Status Report includes the most current breeding population and production information available for waterfowl in North America. According to the 2011 USFWS Waterfowl Population Status Report, the total duck population estimate was 45.6 ± 0.8 million birds and represents an 11% increase over last year's estimate of 40.9 ± 0.7 million birds; this is 35% above the long-term average (1955-2010). Mallard abundance was estimated to be 9.2 ± 0.3 million birds which was 9% above the 2010 estimate of 8.4 ± 0.3 million birds and 22% above the long-term average. The projected mallard fall-light index was 11.9 ± 1.1 million birds (USFWS 2011e).

In 2011, approximately 66,724 ducks were harvested through 64,815 hunter trips on all Illinois DNR lands; this resulted in a 49% increase from the 2010 harvest. Currently the Refuge allows hunting on approximately 15,000 acres; under this alternative waterfowl hunting opportunity would increase by 3% or 540 acres. In the 2011 Refuge Annual Performance Planning Report, onsite resource staff estimated a total of 1000 waterfowl hunting visits on Refuge property. In the 2010-2011 Illinois DNR Waterfowl Harvest and Success Rates Report, the estimated success rate per active hunter was 1.03. Using this estimate the 1000 hunter visits correlates to 1030 ducks harvested on Refuge property. The document estimates the success rate per active hunter for Canada geese at

.67 which correlates to 670 geese harvested on Refuge property. These numbers do not affect local, state, or flyway populations or harvest.

Waterfowl are those species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the U.S. Fish and Wildlife Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. Cypress Creek Refuge is located in the Mississippi Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR part 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rule making process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules based on "early" and "late" hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (e.g. dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons generally begin prior to October 1. Late hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties.

Because the Service is required to take an abundance of migratory birds and other factors in to consideration, the Service undertakes a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, State and Provincial wildlife-management agencies, and others. To determine the appropriate framework for each species, the Service considers factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. After frameworks are established for

season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of State and Federal Governments. After Service establishment of final frameworks for hunting seasons, the States may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the Federal frameworks but never more liberal. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an environmental assessment developed when a National Wildlife Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows.

Non-hunted Resident Wildlife:

Non-hunted wildlife include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, and shrew; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs, and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting does not effectively impact their populations regionally.

Disturbance to non-hunted wildlife under either alternative is minimal. Small mammals such as voles and mice are generally nocturnal or secretive. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor of cold-blooded reptiles and amphibians also limits their activity during most of the hunting season when temperatures are low. Hunters would rarely encounter reptiles and amphibians during most of the hunting season. Some species of butterflies and moths are migratory and will not be present for most of the Refuge's hunting season. Resident invertebrates are not active during cold weather and would have few interactions with hunters during the hunting season. Impacts to these species due to habitat disturbance related to hunting are negligible at the local and flyway levels.

Direct impacts to non-hunted migratory birds such as woodpeckers, raptors, and some songbirds including indigo buntings, red-winged blackbirds, nuthatches, finches, chickadees are negligible. Secondary impacts to this group of species are also minimal and do not appreciably reduce their numbers at the population level. Shorebirds and wading birds would not be impacted by hunting since, in most cases, they have already migrated through the area prior to the fall hunting season. Disturbance by hunting to non-hunted migratory birds would not have substantial negative secondary impacts because the majority of hunting does not coincide with the nesting season except in the case of spring turkey hunting. Because of turkey hunting restrictions, dates, and limits any disturbance to non-hunted species would be minimal. Other disturbance to these species by hunters afield would be temporary in nature. The Refuge has identified important resting and feeding areas for migratory birds and has designated them as no hunting zones.

Migratory birds of prey (eagles, hawks, etc.) are on the Refuge during most hunting seasons but disturbance is minimal. Disturbance to the daily wintering activities, such as feeding and resting, of residential birds might occur but are insignificant because such interactions are infrequent and of short duration when they do occur. Areas around eagle nests are closed to all refuge users, including hunters, during the spring turkey season so there would be negligible adverse impact.

Overall, hunting impacts to non-hunted species and their habitats and impacts to the biological diversity of the Refuge will be insignificant.

4.2.5.B Anticipated Direct and Indirect Impact of Proposed Hunt on Refuge Programs, Facilities, and Cultural Resources

Other Refuge Wildlife-Dependent Recreation: Most visitation occurs from February through December for hunting, fishing, and bird/wildlife observation. Since refuge establishment in 1990, a variety of public uses have taken place on the refuge. There have been very few conflicts between hunters and non-hunters (wildlife observation, school programs or special events). This alternative (which is compatible with the Refuge purpose) will provide 608 additional acres for hunters to enjoy.

Refuges Facilities: Impact to Refuge facilities (roads, parking lots, and trail) will be minimal with this alternative. Currently Refuge staff maintains existing roads and parking areas for maintenance access; these facilities will receive an increase in use with the addition of hunter use but impacts will be minimal and short-term due to foot access only.

Cultural Resources: This alternative will not have any additional impacts to cultural resources. No buildings or structures exist on the site and it is not listed on the National Register of Historic Places. Hunting activities will not cause ground disturbance and there will be no effect on cultural resources

4.2.5.C Anticipated Direct and Indirect Impact of Proposed Hunt on Refuge Environment and Community

No measureable impacts are expected by this proposed action on the Refuge environment which includes soils, vegetation, air quality, and water quality. Some disturbance to surface soils and vegetation may occur, however these disturbance would be minimal. Motorized access will be limited to parking areas only.

In 2002, the Refuge accounted for 53, 870 visitor days; waterfowl hunting accounted for 29 percent, small game hunting for 13.3 percent, and deer hunting for 5.8 percent. According to research on economic effects, hunting on the Refuge resulted in significant expenditures (1.1million) for both travel-related goods and services and activity related equipment purchases (Caudill, 2003). The impacts occurred within the four county area surrounding the Refuge. The proposal to open hunting on an additional 648 acres within the Refuge should have minimal impact on the amount of visitor expenditures.

Hunting, along with fishing, wildlife observation, nature photography and education is a primary purpose established by the Service for these lands. The Service has allowed public hunting since Refuge establishment in 1990. Since this time, the Refuge has not observed any substantial adverse effects of this hunting program on Refuge management objectives. This use was also determined compatible with the purpose of the Refuge and National Wildlife Refuge System's mission.

The closure of goose hunting on the Bellrose Waterfowl Reserve will have minimal impact on hunting opportunity since 15,000 acres of the Refuge is open to hunting for the entire waterfowl season. This acreage provides individuals numerous opportunities for goose hunting within the Refuge as well as several wetlands locally owned by the Illinois DNR and The Nature Conservancy. In exchange, closure of the Reserve will provide an undisturbed waterfowl sanctuary during biologically critical periods of the day and throughout the entire migration and wintering period.

4.2.5.D Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Southernmost Illinois has a long history of hunting and fishing. The majority of the land acquired by the Refuge was previously hunted and hunting has been permitted since the approval of the 1992 Refuge Hunt Plan. If public use levels expand in the future, unanticipated conflicts between user groups may occur. Service experience has proven that time and space zoning can be an effective tool to eliminate conflicts between user groups. The Project Leader will determine if such a tool is necessary to limit conflicts on a case by case basis.

4.2.5.E Anticipated Impacts If Individual Hunts Are Allowed To Accumulate

The Refuge will continue to conduct a hunting program in coordination with Illinois Department of Natural Resources guidelines. Hunting of deer, turkey, small game, and migratory game birds will have minimal impacts to local, regional, state and flyway populations. The majority of the Refuge was open to hunting prior to acquisition. Refuge staff expect approximately the same number animals will be harvested on Refuge lands as were when the 608 acres were in private ownership. Refuge staff expect and witness that most hunters respect spacing needs between hunters and blinds and will essentially regulate themselves. User conflicts are not expected but will be monitored and dealt with on a case-by-case basis.

4.2.6 Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their

programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities' access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects unique to minority or low-income populations in the affected area. The proposed action will not disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

The Refuge Recreation Act of 1962 (16 U.S.C.460K) and the National Wildlife Refuge System Administration Act of 1996 (16U.S.C. 668-ddee) provide authorization for hunting and fishing on National Wildlife Refuges. The effects of hunting and fishing on refuges have been examined in several environmental review documents including the Final Environmental Impact Statement on the Operation of the National wildlife refuge System (1976), Recommendation on the Management of the National Wildlife Refuge System (1978) and the draft EIS on the Management of the National Wildlife Refuge System (1988). Nothing in the establishing authority of Cypress Creek National Wildlife Refuges precludes hunting on the Refuge.

As stated, public hunting has been allowed on the Refuge since 1990 . During this period, public hunting has not resulted in any significant adverse effects on Refuge resources and management activities; the same should be true for the addition of 608 acres for hunting on the Refuge.

4.3 Summary of Environmental Consequences

Table 9. Summary of Environmental Consequences

Effect	Alternative B (No Action) Maintain Existing Hunt Program with No Hunting on Newly Acquired Lands	Alternative C (Preferred Action) Maintain the hunting program with revisions to the Code of Federal Regulations (CFR) and the addition of newly acquired lands.
Habitat	Possible depredation of native vegetation and adjoining cropland.	Minimal Effect
Biological	Deer and Canada/Snow geese populations remain high and may cause depredation.	Some disturbance to migratory birds, upland/small game and deer.
Listed Species	No effect	No effect
Historic & Cultural Resources	No effect	No effect
Cumulative Impacts	Minimal effect.	Minimal effect

Environmental Justice	Does not provide for priority public uses listed in the Refuge Recreation Act, and NWRS Admin. Act and the NWRS Improvement Act or Refuge establishment documentation. Hunting is permitted throughout the Refuge and on adjoining state property.	Hunting is authorized by Migratory Bird Conservation Act, Refuge Recreation Act, and NWRS Admin. Act and the NWRS Improvement Act; this activity is listed in establishing EA and Comprehensive Management Plan as a priority public use.
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Chapter 5: REGULATORY COMPLIANCE

The following acts authorize the U.S. Fish and Wildlife Service to administer hunting on National Wildlife Refuges. The Refuge Recreation Act of 1962 (16U.S.C 460K) authorizes the Secretary of the Interior to administer National Wildlife Refuges for public recreation as an appropriate incidental or secondary use 1) to the extent that is practicable and consistent with the primary objectives of the Refuge, and 2). Provided that funds are available for the development, operation, and maintenance of permitted recreation.

The National Wildlife Refuge System Administration Act of 1966 (16U.S. 688dd-ee) authorizes the use of any area within the NWR System for any purpose, including but not limited to hunting, fishing, and public recreation whenever those uses are determined to be compatible with the purpose for which the area was established. The Refuge Improvement Act of 1997 is the latest amendment to the NWRS Administration Act which supports the authorization of hunting and other recreational uses on Refuge lands.

The Final Environmental Assessment for the establishment of the Refuge (1990) identified providing compatible wildlife-dependent recreational uses such as hunting, fishing, wildlife observation and photography, environmental education and interpretation as being a primary goal of the Refuge. Hunting was also identified in the in the 1996 Comprehensive Management Plan (CMP) for the Refuge as being priority public use that is authorized and will follow state seasons. The Service determined that this use is compatible with the purpose of the Refuge and the mission of the National Wildlife Refuge System.

Chapter 6: LIST OF PREPARERS

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Chapter 8: CONSULTATION AND COORDINATION WITH OTHERS

Chapter 9: PUBLIC COMMENTS ON DRAFT DOCUMENTS

The Environmental Assessment was released for public comment from _____ to _____

Chapter 10: LITERATURE CITED

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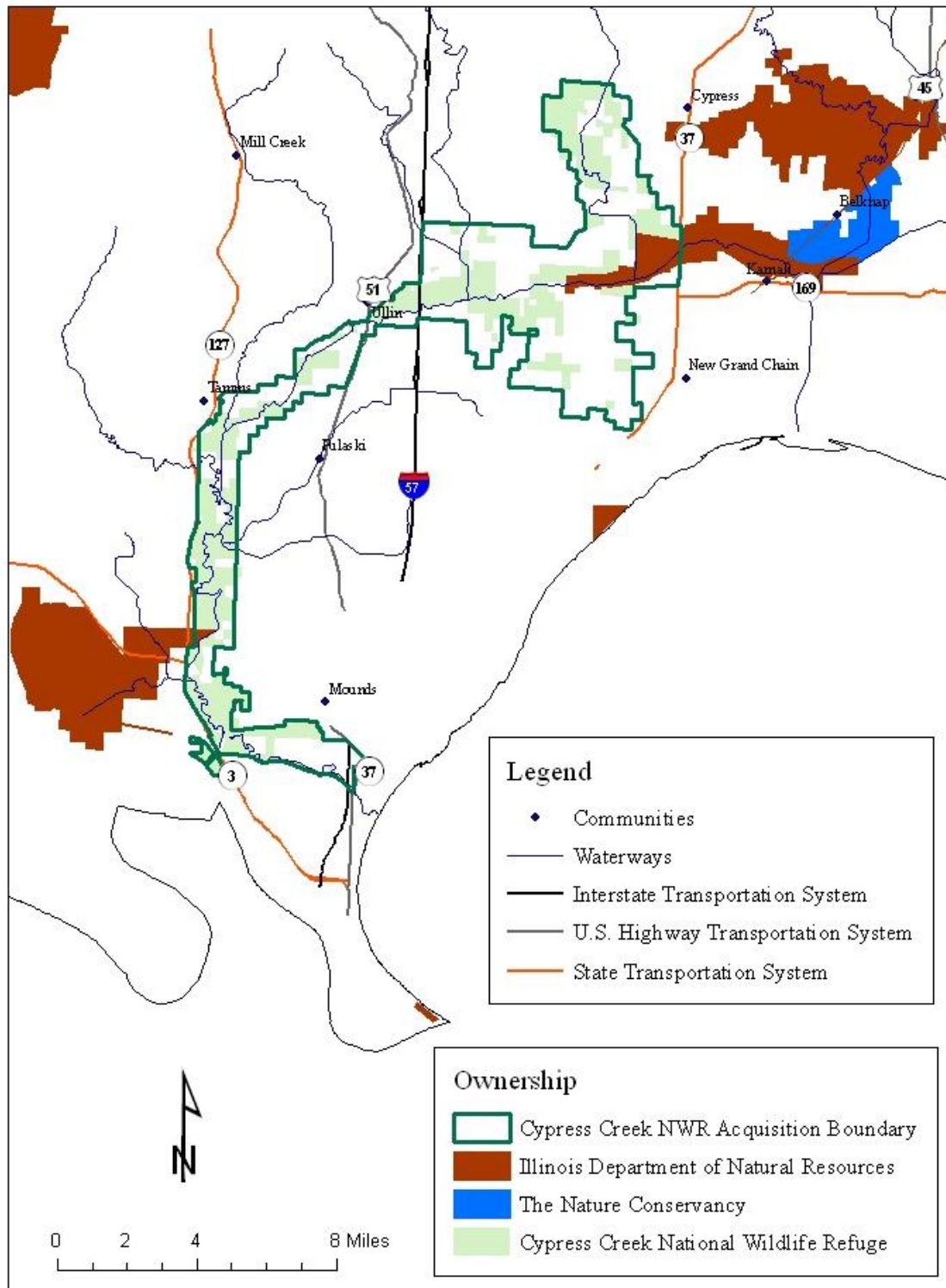
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APPENDIX A.

Figure 4. Cypress Creek National Wildlife Refuge Ownership and Acquisition



APPENDIX B:

